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New Data on Late Santonian and Early Maastrichtian Ostracodes of the Saratov Region

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Abstract—The article presents a paleoenvironmental analysis of ostracode assemblages from Mezino-Lapshinovka (Upper Santonian) and Lokh (Lower Maastrichtian) Formations of the Vishnevoe section (Saratov Region). Two new species *Cytherelloidea vishneviensis* sp. nov. and *Mauritsina mandelstami* sp. nov. are described.

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INTRODUCTION

This work is additional to the publication describing Upper Cretaceous deposits of the northwestern Saratov Region (Olfer'ev et al., 2007). The mentioned publication reviews the study history of the section at the Vishnevoe village, and provides its description and biostratigraphic analysis based on macro- and microfaunal remains, including ostracodes. The studied ostracodes belong to 21 species, two of which, *Cytherelloidea vishneviensis* and *Mauritsina mandelstami*, are described as new in the present contribution. The article also includes the paleoenvironmental analysis of ostracodes from the Vishnevoe section.

Dimensions on some images in plates and/or measure bars in the paper of Olfer'ev et al. (2007, pl. 8, 9) were not correct. Corrected measure bars for these images are given here (Plates 9, 10).

MATERIAL AND METHODS

Though the Vishnevoe section comprises the deposits of nearly the entire Upper Cretaceous, from Turonian through Maastrichtian, ostracodes were found only in two levels in "*Pteria* beds" of the Mezino-Lapshinovka Formation in the Upper Santonian (sample 42, 43, 79, 80), and in the Lokh Formation in the Lower Maastrichtian (sample 120). Distribution and numbers of studied ostracodes are summarized in Table 1.

As evident from the table, the studied fossils form two assemblages different in taxonomic composition and abundance values. The first one, markedly more diverse and more abundant, includes 20 species coming from the Mezino-Lapshinovka Formation. It is represented by common species as *Cytherella obovata* Jones et Hinde, *Cythereis ornatissima* (Reuss), *Spinicythereis acutiloba* (Marsson), *Neocythere* sp., *Mauritsina mandelstami* sp. nov., *Golcocythere quadrulatus* (Sharapova), and *Eucythere* sp., occurring in all samples and most abundant. Quite characteristic are also *Cytherelloidea vishneviensis* sp. nov. and *Pterygocythere turonica* (Mandelstam). Sporadic and occurring not in all samples are *Cytherella ovata* (Roemer), *C. contracta contracta* Veen, *Paracypris depressa* Bonnema, *Physocythere minuticosta* (Szczechura), *Phacorhabdotus* aff. *lonsdaleianus* (Jones), *Pterygocythere* sp., *Krithe simplex* (Jones et Hinde), *Eucythere* aff. *tenuis* Herrig, *Xestoleberis* sp., *"Cytherura"* sp., and *"Exophthalmocythere"* sp. More than half of species have a sculpture with various ornamentation features.

The second assemblage was obtained from the terminal part of the Lokh Formation. It includes seven species, six of which also occur in the first assemblage, and one form (*Argilloecia* sp.) is the first appearance. The Lokh ostracodes differ from the Mezino-Lapshinovka assemblage not only in three times lower taxonomic diversity, but also in a considerable reduction of their abundance. All species, except *Cytherella obovata*, are represented by sporadic specimens. Almost all ostracodes have smooth carapaces. Ornamented forms are represented by a single fragment of *Cythereis ornatissima*.

PALEOENVIRONMENTAL ANALYSIS OF STUDIED OSTRACODES

All ostracodes found in the section belong to the genera adapted to the normal salinity. It excludes a close presence of large river estuaries and, taking into account the epicontinental character of the basin, proximity of the coastline too. The below given paleoenvironmental analysis of both assemblages, however, evidences a shallow water conditions in the marine basin.

Considering ostracodes of the Mezino-Lapshinovka Formation (Table 1), it is obvious that smooth-

Table 1. Distribution of studied ostracodes in samples

Formation	Mezino-Lapshinovka				Lokh
Ostracodes	Sample 42	Sample 43	Sample 79	Sample 80	Sample 120
Cytherella ovata (Roemer, 1841)				1 a	
C. obovata Jones et Hinde, 1890	6 al	14 al	13 al	22 al	18 al + 1 c
C. contracta contracta Veen, 1932			4 a	3 a	7 a
Cytherelloidea vishneviensis sp. nov.	3 a		3 a	2 a	
Cythereis ornatissima (Reuss, 1846)	2 al	3 a	4 a	6 a	1 a
Spinicythereis acutiloba (Marsson, 1880)	9 a + 2 c	9 a +1 c	9 a +1 c	7 a	
Pterygocythere turonica (Mandelstam, 1958)	1 a		1 a	7 a	
Neocythere sp.[1]	15 al	3 al	8 a + 1 c	3 al	
Mauritsina mandelstami sp. nov.	11 al	6 a	15 al + 2 c	11 a	
Golcocythere quadrulatus (Sharapova, 1939)	8 al + 2 c	4 a +1 c	3 a	5 a	
Eucythere sp.	6 al	3 a	5 al	5 a	1 a
Krithe simplex (Jones et Hinde, 1890)	3 al			1 a	3 a
Physocythere minuticosta (Szczechura, 1965)	1 l			1 a	
"Cytherura" sp.				1 a	
Argilloecia sp.					1 a
Paracypris depressa Bonnema, 1940		1 a + 1 c			1 a
Pterygocythere sp.	2 al			1 a	
"*Exophthalmocythere"* sp.	1 a				
Eucythere aff. *tenuis* Herrig, 1963	4 a				
Phacorhabdotus aff. *lonsdaleianus* (Jones, 1849)		2 a + 1 c			
Xestoleberis sp.		1 a			

Notes: [1] This form was described and figured by Andreev (1986) as *N. arenosa aculeata* Andreev.
Designations: figures stand for numbers of specimens; a, specimen represents valve of adult individual; l, specimen represents larval valve; al, co-occurring valves of adult and larval individuals; c, entire carapace.

valve eurybiontic forms of *Cytherella* dominate in numbers in all samples. Nevertheless, the diversity of the first assemblage is due to sculptured forms. Morphofunctional analysis of their carapace has shown that the share of forms adapted to oozy grounds, ornamented with spines and wing-like processes (*Pterygocythere, Phacorhabdotus* and *Cythereis*), gradually increases up the section from 3 specimens in samples 42 up to 13 specimens in sample 80. It, apparently, indicates an increase in the clay content of deposits in the bed 29. At the same time, the sculptured ostracodes include mostly forms of oozy-sandy grounds as forms of *Mauritsina, Golcocythere* (shallow coastal genus; Ohmert, 1970, 1973; Pokorny, 1983), *Neocythere*, and *Spinicythereis* with carapaces bearing longitudinal and transverse ribs, reticulate structures, and tubercles. Therefore, ostracodes of the first assemblage indicate quiet coastal conditions with weakly sorted substratum and a low bottom hydrodynamics. On the other hand, the low energy of bottom waters, that excludes a transport of ostracodes, and autochthonous deposition are evidenced by good preservation of most specimens, and also by a co-occurrence for some species of carapaces and valves of both adult and larval individuals belonging to different generations.

All listed sculptured genera, judging by their geographical distribution (Table 2), irrespective of substrate preferences, inhabited warm Tethyan waters or were eurythermal. Additionally, these forms show weekly convex or flattened eye tubercles (Pls. 9, 10) indicating quite low depths of habitation of first meters (not deeper than first tens of meters). Thus, all these features point to a shallow and warm-water sedimentary basin. This conclusion is supported by the occurrence of the tropical shallow water areas indicator, the genus *Cytherelloidea*. The additional evidence of shallow-water conditions of the described assemblage includes drillings on the some valves, similar to those of some modern algae. The preferable depths of these algae are not lower than 50 m.

Table 2. Geographic and stratigraphic distribution of studied species

	England (Bosquet, 1854; Kaye, 1964; Herrig, 1966; Szczechura, 1965, 1989)	**Belgium** (Bosquet, 1854; Szczechura, 1965, 1989)	**Paris Basin** (Deroo, 1956, 1966)	**Netherlands** (Herrig, 1966; Szczechura, 1965, 1989)	**Denmark** (Szczechura, 1965, 1989)	**Rügen Island, Germany** (Herrig, 1966; Reich, Frenzel, 2002)	**Germany** (Herrig, 1966; Szczechura, 1965, 1989; Ansorge et al. 1999)	**Czechoslovakia** (Herrig, 1966; Pokorny, 1977)	**Poland** (Herrig, 1966; Szczechura, 1965, 1989) 1989)	**Bulgaria** (Herrig, 1966)	**Belarus** (Szczechura, 1965, 1989)
Cytherella ovata	Cretaceous		Albian–Senomanian				Senonian-Turonian, Maastrichtian	Upper Cretaceous	Neocomian	Hauterivian	
Cytherella obovata											
Cytherella contracta contracta				Lower Maastrichtian			Lower Maastrichtian				
Krithe simplex						Lower Maastrichtian					
Cythereis ornatissima	Upper Cretaceous	Senonian					Lower Maastrichtian	Coniacian			
Spinicythereis acutiloba	Upper Cretaceous		Upper Campanian	Maastrichtian	Paleocene	Lower Maastrichtian	Lower Maastrichtian		Upper Campanian–Eocene		Campanian
Golcocythere quadrulatus											
Pterygocythere turonica											
Paracypris depressa							Lower Maastrichtian				
Physocythere minuticosta						Lower Maastrichtian	Lower Maastrichtian		Upper Campanian–Maastrichtian		
Neocythere sp.											

Table 2. (Contd.)

Mangyshlak (Mandelstam et al., 1958; Tesakova, 1992)	**Ukraine** (Didenko, 2002, 2003)	**Emba district** (Sharapova, 1937)	**Ulyanovsk Volga Region** (Selivanovskii, 1968)	**Ozinki station area, Saratov Region** (Sharapova, 1939)	**South cis-Urals, Turgai Depression**, (Nikolaeva, Andreev, 1999)	**West Siberian lowland** (Lyubimova et al., 1960; Khokhlova, 1960)	**Cis-Urals** (Nikolaeva et al., 1999a)	**Northern Kazakhstan** (Nikolaeva et al., 1999a)	**Tobol River basin** (Nikolaeva et al., 1999a)	**Middle Asia** (Andreev, 1986; Nikolaeva, 1999)
Upper Maastrichtian and Lower Danian	Maastrich	Turonian, Maastrichtian	Turonian, Coniacian, Santonian, Campanian, Upper Maastrichtian	Campanian, Maastrichtian		Maastrich				
			Upper Maastrichtian	Campanian		Maastrich				
Upper Maastrichtian and Lower Danian	Maastrich	Turonian and Campanian								
			Coniacian, Lower Campanian and Upper Maastrichtian	Campanian		Maastrich				
			Turonian, Coniacian, Upper Santonian, Lower Campanian			Maastrich				
Upper Maastrichtian and Lower Danian	Maastrich	Turonian–Paleocene			Campanian, Maastrichtian					
				Campanian		Maastrich				
Turonian										Turonian–Coniacian
Lower Danian										
Upper Maastrichtian							Campanian	Maastrich	Maastrich	
										Upper Campanian–Maastrichtian

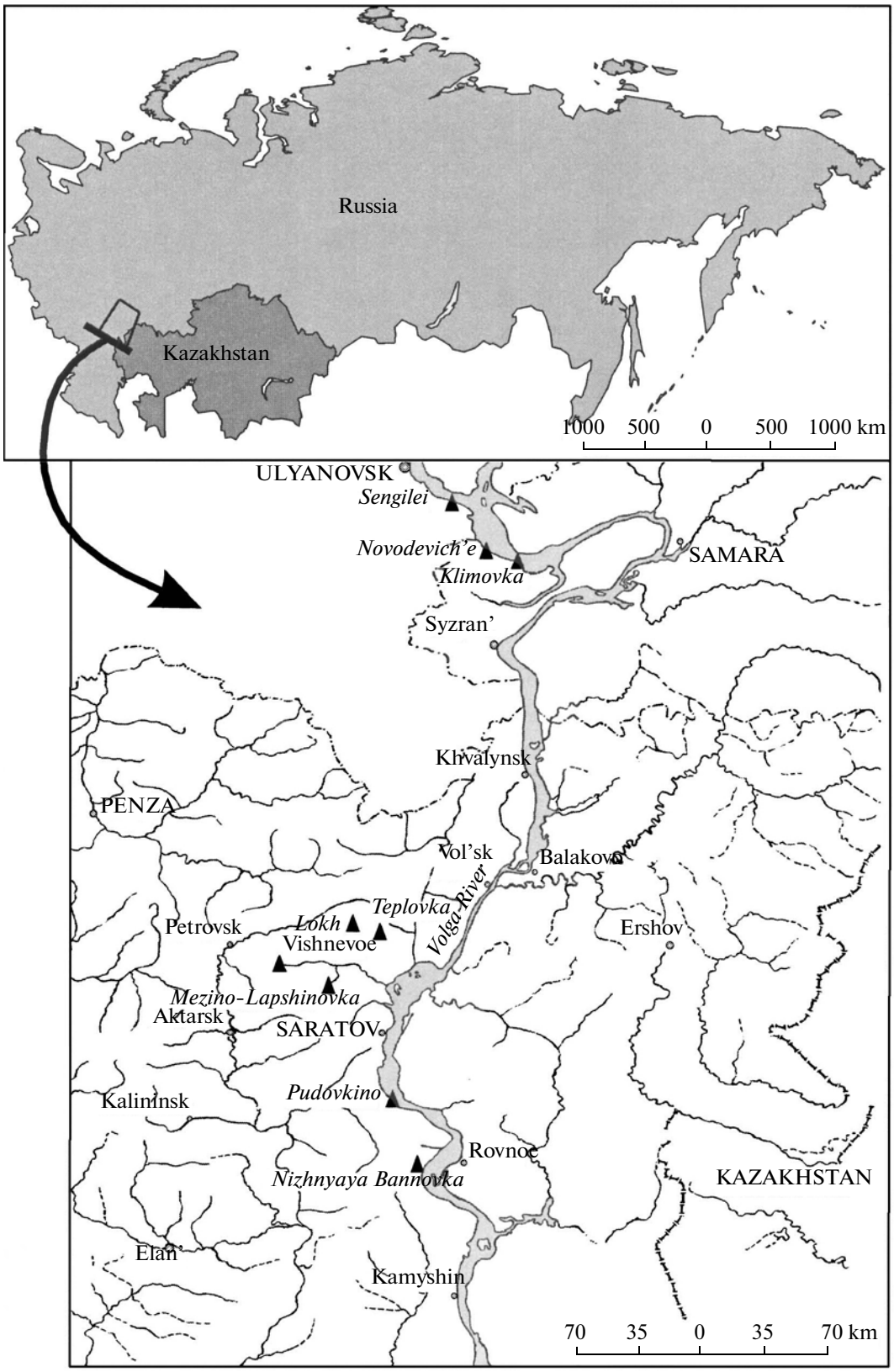

Fig. 1. Location of the Vishnevoe section and other previously studied section of Upper Cretaceous deposits (after Olferiev et al., 2007). Designation: (▲) Location of the studied section.

To sum up the stated above, it is possible to assume for the assemblage in question, coming from beds 29 and 31 (interval 4.3–44.8 m) of the "*Pteria* beds" in the Mezino-Lapshinovka Formation, relatively favorable conditions of warm, shallow and quiet basin, most likely, in the upper sublittoral zone.

A similar conclusion is possible from the comparison of the studied ostracodes with the different ecological associations defined by Andreev for Cretaceous ostracodes of Central Asia (Nikolaeva et al., 1999b. The genera *Cytherella, Cytherelloidea, Cythereis, Spinicythereis, Krithe, Golcocythere, Mauritsina*, making a core of the first assemblage, Andreev considered as characteristic representatives of the ecological group I, i.e., polytaxic marine community of stenohaline genera of carbonate facies. This group characterizes a shelf below the phytal zone (27 m) with oceanic salinity. Genera *Pterygocythere, Neocythere, Physocythere,* and *Xestoleberis*, also present in the first assemblage, most frequently occur in the ecological association 3, that of polytaxic marine community without brackish-water elements, but with some phytal forms. This group includes dominant ornamented species frequently bearing wing-like processes (distinct feature of the fauna of shallow-water epipelos), as *Pterygocythere*. This group is typical for depths from 100 m and lower, up to the boundary with the eulittoral zone, with conditions of quiet hydrodynamics and good aeration of bottom waters and sediments. Altogether the present genera show depths between 27 and 100 m. Taking into account the above mentioned algal drillings on ostracodes valves, we assume depths of the basin as about 30–40 m.

In the Lokh time, the environment of ostracodes strongly deteriorated. This is indicated by a considerable change in the community structure that combines a strong reduction of species diversity and a total decrease in abundance. The second assemblage nearly completely consists of smooth-walled eurybiontic *Cytherella*. Only sporadic representatives of the genera *Eucythere, Krithe, Argilloecia*, and *Paracypris* have been found. These genera are also considered as eurybiontic and have no ornamentations. The dominance of unspecialized forms and the simplification of the community (reduction in numbers) at this level can have two explanations. First, it can be an indication of stable unfavorable conditions, most likely, a temperature decrease of bottom waters. Second, it can be considered as an initial stage of reorganization of the community caused by instability of some factors. Noteworthy that the Lokh ostracodes association includes the eurybiontic genus *Argilloecia*, which in combination with *Krithe* and *Cytherella* and the absence of shallow sculptured species and *Cytherelloidea*, can indicate deeper and colder conditions. But because ostracodes valves in this assemblage also show signs of algal drilling, a deepening, if any, was insignificant and ranged about several tens of meters not surpassing the lower boundary of the upper sublittoral. In summary, ostracodes of the Lokh time indicate a cooler bottom waters, possibly, associated with a slight deepening of the basin.

SYSTEMATIC PALEONTOLOGY

Ostracodes shown on plates 9 and 10 were photographed in the SEM laboratory of the Paleontological Institute of the Russian Academy of Sciences. The description of new species is given below. The material has a satisfactory to excellent preservation. The collection no. 309 is stored in the Department of Paleontology of the Moscow State University (KPMGU). Supraspecific taxonomy follows the Practical guidebook on microfauna (Andreev et al., 1999).

Order Platycopida

Family Cytherellidae Sars, 1865

Subfamily Cytherelloidinae Andreev, 1999

Genus *Cytherelloidea* Alexander, 1929

***Cytherelloidea vishneviensis* Tesakova, sp. nov.**

Plate 9, figs. 7–9

Etymology. From the Vishnevoe village.

Holotype. Department of Paleontology of the Moscow State University (KPMGU) no. 309–4, right valve of female; Russia, Saratov Region, Vishnevoe section; Upper Cretaceous, Upper Santonian, Mezino-Lapshinovka Formation.

Description. Carapace is medium sized, rounded rectangular, poorly convex, with a flattened lateral surface. Right valve is slightly larger than the left one. It overlaps it along the entire test's margin, but most strongly, dorsally and posterodorsally. Dorsal and ventral margins are parallel. The anterior and posterior edges are of equal height, arch-like rounded, and smoothly grade into dorsal and ventral margins. On the left valve, the rear end is weekly truncated in the upper part because of the overlap of the right valve. Maximal height and thickness of a valve is constant between anterior and posterior edges; the maximal length is at the valve's midheight. The entire contour of the valve is traced by a distinct circular fillet-like rib. It is interrupted only in the middle of the dorsal margin where it, slightly deviating ventrally, runs above a shallow subcentral pit. In this short interval, it becomes thin and sinuous. From a faint angular tubercle at the posterior edge, a short median, frequently sinuous riblet runs first obliquely to the ventral margin and then parallel to it below the subcentral pit. This riblet terminates, similar to sinuous part of the circular rib, at the anterior edge. The entire surface of valves between ribs is covered with small tubercles.

Measurements, mm:

	L	H	T
Specimen no. 309–5	0.58	0.28	0.13
Holotype no. 309–4	0.54	0.30	0.13

Variability. The expression of tubercles and sinuosity degree of the median riblet slightly vary.

Comparison. Cretaceous deposits of Europe and Central Asia yielded numerous species very similar with the described one in sculpture. But the present differences exclude its attribution to one of them. From *C. binkhorsti* Veen, 1932 from the Lower Campanian of Belgium (Limburg) (Bless, 1988, fig. 6a) the new species differs in tubercular intercostal surface. From *C. elliptica* Kuznetsova, 1961 from Barremian of Azerbaijan (Kuznetsova, 1961, p. 38, pl. 4, figs. 2, 3) it differs in tubercular intercostal surface. From *C. hindei* Kaye, 1964 from Santonian of England (Kaye, 1964, p. 72, pl. 9, fig. 4b, 8b, 11) it differs in entirely tuberculate valve surface, including the posterior part, and also in massive circular ridge-like rib not falling in separate tubercles. From *C. obvallaris* (Mandelstam) from Santonian to Maastrichtian of Central Asia (Andreev and Vronskaya, 1970, p. 72, pl. 2, figs. 4, 5), in tubercular sculpture, sinuous (not straight) median riblet, straight (not concave) dorsal and ventral margins.

Comments. *C. obvallaris* was described as a new species authored by Mandelstam in Andreev and Vronskaya (1970). Subsequently, in dissertation of Andreev (1986, p. 22, pl. 4, fig. 19) it was considered as a subspecies of *C. hindei* Kaye, 1964 and erroneously listed as *C. obvallaris hindei* Kaye, 1964.

Material. Eight well-preserved adult valves from the type locality.

Family Trachyleberididae Sylvester-Bradley, 1948

Subfamily Trachyleberidinae Sylvester-Bradley, 1948

Genus *Mauritsina* Deroo, 1966

***Mauritsina mandelstami* Tesakova, sp. nov.**

Plate 10, figs. 7–12

Etymology. In honor of micropaleontologist M.I. Mandelstam.

Holotype. KPMGU, no. 309–17, left valve of male; Russia, Saratov Region, Vishnevoe section; Upper Cretaceous, Upper Santonian, Mezino-Lapshinovka Formation.

Description. Carapace of the medium size, rounded trapezoid, elongated, poorly convex. The left valve is slightly larger than the right one, and overlapping it at anterodorsal and posterodorsal borders. Dorsal and ventral margins are nearly parallel, poorly converging toward the posterior margin. The anterior margin is high, arch-like rounded; the posterior one is lower than the anterior, rounded triangular. Both margins are flattened, smoothly grade into the ventral margin, and dorsally grade into hingement zone through auricles. Right valves show somewhat stronger dorsal truncation. The maximal length of valve is at its midheight, the maximal height, in the anterior third, and the maximal thickness, in the posteroventral area. At the midheight of the anterior third of the valve, there is large, strongly convex, slightly elongated muscular tubercle. Small, but the distinct eye tubercle, located at the beginning of the dorsal margin, is better expressed on left valves. The carapace surface bears three longitudinal and one transverse ribs. The longest of longitudinal ribs is the ventral one. It is high, relatively narrow, rounded in section, and runs along the entire ventral margin, smoothly grading at the anterior edge into a distinct arch-like, pointed in cross section rib, which runs parallel to the anterior margin of the valve. The second longitudinal rib, the median one, is parallel to dorsal and ventral margins posteriorly, but runs through the muscular tubercle and distinctly deviates anteroventrally. The dorsal rib, the shortest and least convex, is more expressed posterodorsally. Not reaching the eye tubercle, it gradually disappears deviating ventrally. Posteriorly, all three longitudinal ribs (more frequently the median one) can break into one to three small tubercles and sharply terminate at the posterior edge. The posterior terminations of dorsal and median ribs are connected with a short and thin vertical riblet. A small, very short riblet runs from the eye tubercle nearly vertically down.

Explanation of Plate 9

All specimens in the plate are from Mezino-Lapshinovka Formation the Vishnevoe section (beds 29 and 31, interval of 43.3–44.0 and 44.3–44.8 m).

Fig. 1. *Cytherella ovata* (Roemer, 1841): specimen, no. 309–48, right valve, female, lateral view.

Figs. 2 and 3. *Cytherella contracta contracta* Veen, 1932: (2) specimen, no. 309–2, left valve, male, lateral view; (3) specimen, no. 309–3, right valve, male, lateral view.

Figs. 4–6. *Cytherella obovata* Jones et Hinde, 1890: (4) specimen, no. 309–1, right valve, male, lateral view; (5) specimen, no. 309–39, left valve, male, inner view; (6) specimen, no. 309–40, left valve, male, lateral view.

Figs. 7–9. *Cytherelloidea vishneviensis* sp. nov.: 7. specimen, no. 309—34, left valve, male, lateral view; 8. holotype, no. 309—4, right valve female, lateral view; 9. specimen, no. 309—5, left valve, female, lateral view.

Fig. 10. *Paracypris depressa* Bonnema, 1940; specimen, no. 309–37, right valve, inner view.

Figs. 11–14. *Eucythere* sp.: (11) specimen, no. 309–30, right valve, male, lateral view; (12) specimen, no. 309–22, right valve, female, lateral view; (13) specimen, no. 309–54, right valve female, inner view; (14) specimen, no. 309–33, left valve, male, lateral view.

Figs. 15–17. *Eucythere* aff. *tenuis* Herrig, 1963: (15) specimen, no. 309–26, right valve, larva, lateral view; (16) specimen, no. 309–32, right valve, larva, inner view; 17. specimen, no. 309–28, left valve, lateral view.

Fig. 18. *Physocythere minuticosta* (Szczechura, 1965): specimen, no. 309–49, right valve, lateral view.

Plate 9

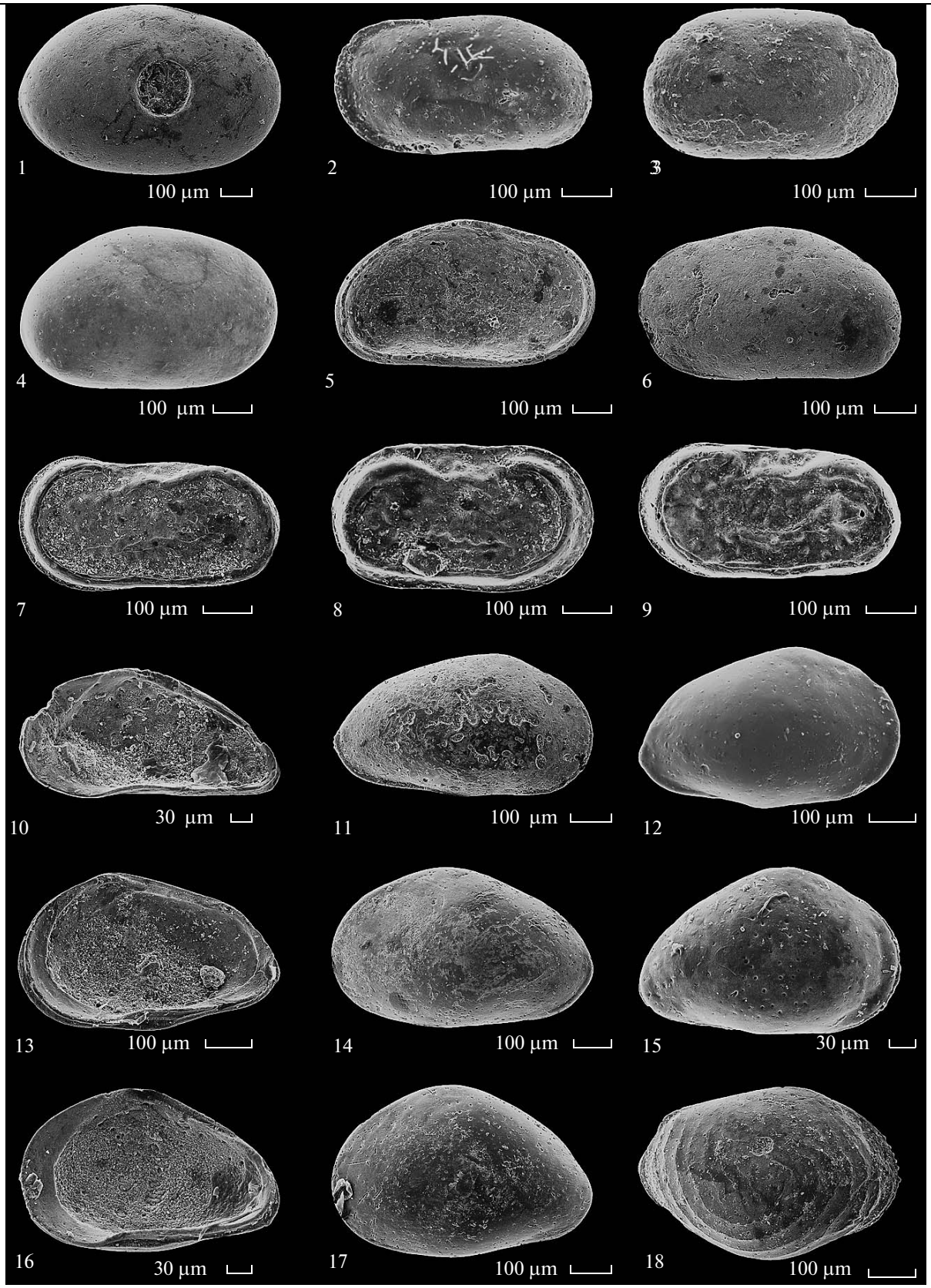
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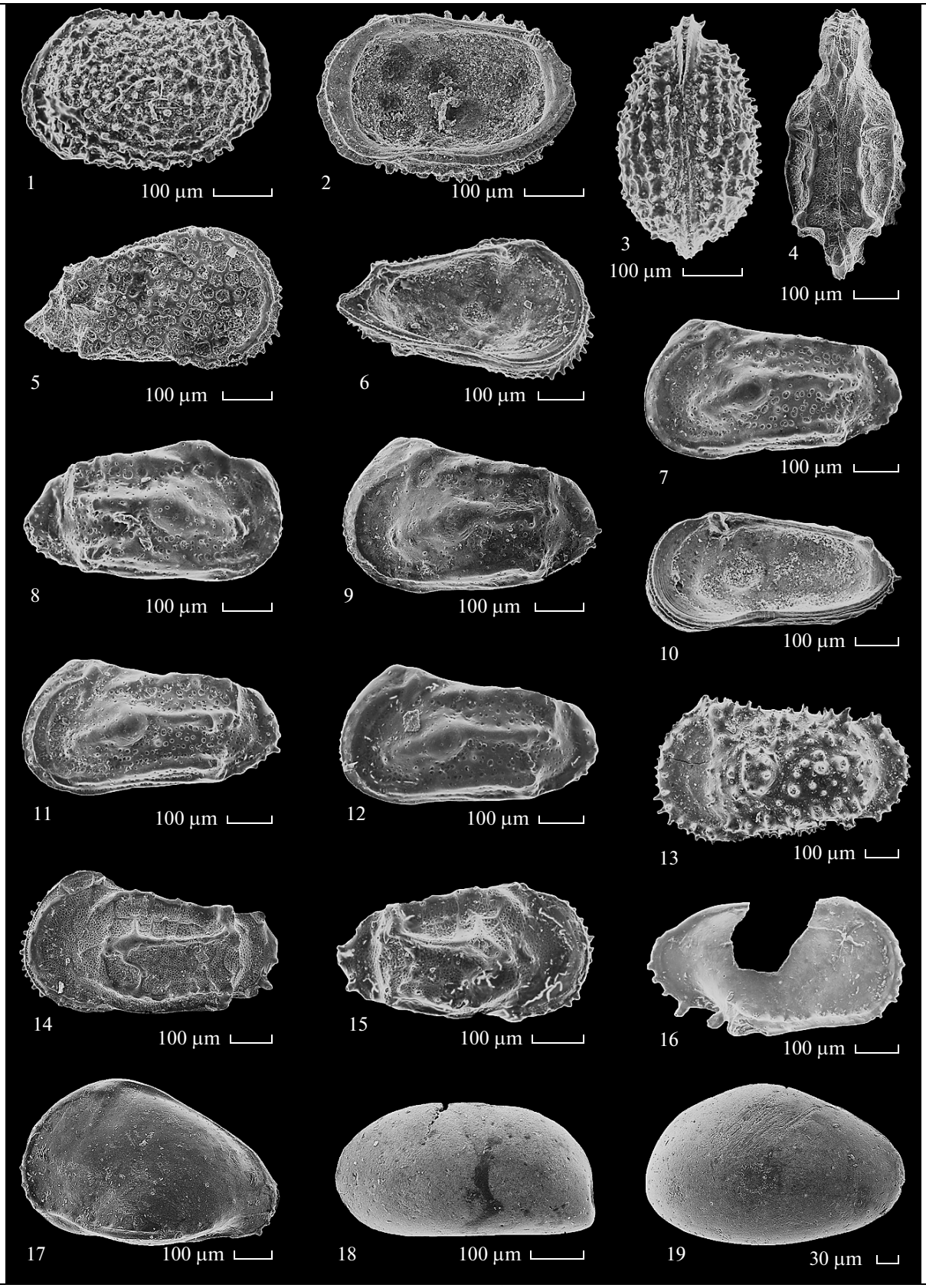
Plate 10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Explanation of Plate 10

All specimens in the plate are from Mezino-Lapshinovka Formation the Vishnevoe section (beds 29 and 31, interval of 43.3–44.0 and 44.3–44.8 m).

Figs. 1–3. *Neocythere* sp.: (1) specimen, no. 309–10, left valve, female, lateral view; (2) specimen, no. 309–37, right valve, female, inner view; (3) specimen, no. 309–12, carapace, ventral view.

Figs. 4, 14, 15. *Golcocythere quadrulatus* (Sharapova, 1939): (4) specimen, no. 309–45, carapace, posterior view; (14) specimen, no. 309–44, left valve, male, lateral view; (15) specimen, no. 309–20, right valve, male, lateral view.

Figs. 5 and 6. *Spinicythereis acutiloba* (Marsson, 1880): (5) specimen, no. 309–46, right valve, male, lateral view; (6) specimen, no. 309–19, right valve, male, inner view.

Figs. 7–12. *Mauritsina mandelstami* sp. nov.: (7) specimen, no. 309–14, left valve, male, lateral view; (8) specimen, no. 309–18, right valve, female, lateral view; (9) specimen, no. 309–43, left valve, female, lateral view; (10) specimen, no. 309–15, right valve, male, inner view; (11) holotype, no. 309–17, left valve, male, lateral view; (12) specimen, no. 309–16, left valve, male, lateral view.

Fig. 13. *Cythereis ornatissima* (Reuss, 1846): specimen, no. 309–6, left valve, male, lateral view.

Fig. 16. *Pterygocythere turonica* (Mandelstam, 1958): specimen, no. 309–8, right valve, lateral view.

Fig. 17. *Pterygocythere* sp.: specimen, no. 309–25, left valve, male, lateral view.

Fig. 18. *Krithe simplex* (Jones et Hinde, 1890): specimen, no. 309–27, left valve, female, lateral view.

Fig. 19. *Xestoleberis* sp.: specimen, no. 309–38, left valve, male, lateral view.

The entire surface of the valve, including ribs, is covered with rounded, sometimes slightly elongate pits of variably size. Largest pits are mostly located in the middle part of the valve. They decrease in size posterior- and anteriorward. Ribs and muscular tubercle typically bear the smallest pits.

Five to six distinct spines occur in the posteroventral area. Signs of numerous but small spines are preserved along the entire extent of the anterior edge.

Measurements, mm:

	L	H	T
Specimen no. 309–16	0.56	0.26	0.14
Holotype no. 309–17	0.55	0.26	0.14
Specimen no. 309–18	0.56	0.28	0.16

Variability. Carapaces of females are higher and shorter than those of males, which are lower and more elongate. In addition, the development of pitted sculpture is variable. The vertical riblet connecting the posterior ends of dorsal and median ribs is variably expressed. The inclination of the short riblet, running from the eye tubercle, shows a slightly variation.

Comparison. In the Upper Cretaceous and Paleogene of France, there is a group of *Mauritsina* species that show strong similarity among themselves and with *M. mandelstami*. From the most similar of them in carapace shape and sculpture *M. lacertosa* (Damotte, 1964) from Campanian of France (Damotte, 1964, p. 102, pl. 1, fig. 2, pl. 2, fig. 9; Babinot et al.1985, pl. 65, figs. 2, 3) *M. mandelstami* differs in more triangular posterior end, ventral deviation of the anterior part of the median rib, and in non-uniform ornamentation with pits of variable size; from *M.* aff. *macrophthalmoidea* (Veen, 1936) from Santonian and Campanian of Provence and Aquitania (Babinot et al. 1985, pl. 65, fig. 15) it is distinct in more triangular posterior margin, well expressed median rib ventrally deviation at its anterior end, and in ornamentation features. From *M. macrophthalmoidea* from the Upper Maastrichtian of the Paris Basin (Deroo, 1966, pl. 16, figs. 398–400) the new species differs in the short oblique riblet running at the anterior edge from the muscular tubercle. From *M. anorchidea* (Veen, 1936) from the Upper Maastrichtian of the Paris Basin (Deroo, 1966, pl. 20, fig. 574–577) it differs is small (as contrasted to large) spines on the posterior end, and sculpture with pits of variable size. From *M. orchidea* (Bosquet, 1852) from the Upper Maastrichtian of the Paris Basin (Deroo, 1966, pl. 20, figs. 595–596) and Maastrichtian of Limburg (Holland) (Bosquet, 1852, p. 98, pl. 6, fig. 9) it differs in the absence of a strongly developed cellular sculpture.

Remarks. From a similar species *Cythereis reginaeastrid* Veen, 1936 from the Lower Maastrichtian of Rügen Island (Germany) (Herrig, 1966, p. 809, pl. 19, fig. 2) *M. mandelstami* differs in thicker and longer (continuing anteriorly from the muscular tubercle) median rib not merging with the ventral rib. From a form with the identical hingement structure and a very similar carapace shape and sculpture (*Idiocythere replicata* Herrig, 1967 from the Upper Campanian of Rügen Island (Herrig, 1967, p. 1228, fig. 4–6, pl. 1, fig. 3)) the new species differs in horizontal position of median and ventral ribs, and also in pitted microsculpture, in contrast to reticulate one in *I. replicata*. From the extremely similar carapace shape and sculpture *Veeniacythereis blanda* (Kaye, 1963) and *V.* aff. *blanda* (Kaye, 1963) from the middle Barremian of Helgoland (Germany) (Bartenstein and Oertli, 1975, p. 14, pl. 1, figs. 11–14, pl. 3, figs. 5, 6) it differs in less dorsally truncated posterior margin; gradual transition of the swelling anterodorsal angle into the posterior margin, in contrast to a distinct depression at this place in *V. blanda* and *V.* aff. *blanda*; in thinner ventral and anterior ribs; better developed dorsal rib, and also in the presence of small vertical riblets at the eye tubercle and in the posterior part of valve. From likewise very similar in sculpture *Mandocythere (Costacythere)*

sp. from the middle Barremian of Helgoland (Bartenstein and Oertli, 1975, pl. 3, fig. 12) the new species differs in thinner ventral and anterior ribs, better developed dorsal rib and in the presence of a small vertical riblet connecting the posterior ends of dorsal and median ribs.

In addition, several forms referred to the genus *Cythereis* (*C. simplex* (Cornuel, 1848), *C. senckenbergi* Triebel, 1940, *C. louvemontensis* Deroo, 1956, *C. cornueli* Deroo, 1956 (Deroo, 1956)) are known in the Lower Cretaceous of France. They are very similar to the new species in carapace shape, number of ribs, and their arrangement on valve. From the most similar-looking of them, the Albian species *C. cornueli* (Deroo, 1956, p. 1518, pl. 4, figs. 59–61), *M. mandelstami* differs in the absence of reticulation of the intercostal surface, presence of short vertical riblets, one at the eye tubercle and the other, on the posterior end, and in horizontal position of the posterior half of the median rib, in contrast to its posterodorsal deviation in *C. cornueli*.

In the Upper Campanian and Maastrichtian of Poland there is another very similar form *Curfsina bosquetina* (Coryell, 1963) (Szczechura, 1989, p. 291, pl. 186, figs. 12, 13), from which the described species differs in non-uniformly pitted surface and the absence of cells covering the entire valve, including ribs.

In Campanian and Maastrichtian of North America (Alabama, Arkansas, Mississippi, North and South Carolina, Georgia, and New Jersey) (Crane, 1965, p. 221, pl. 6, fig. 12; Brouwers and Hazel, 1978, pl. 5, figs. 7–9), there is rather similar in carapace shape, structure of the hingement, and sculpture species *Cythereis communis* Israelsky, 1929. This form that should be assigned to *Mauritsina* is different from *M. mandelstami* in pitted intercostal sculpture and absence of large frequent pores on ribs.

Maastrichtian deposits of Western Siberia (Ayat River) yielded *Cythereis memorabilis* Mandelstam [nom. nud.], illustrated in Khokhlova (1960, pl. 49, fig. 7). It is identical to *Cythereis reginaeastrid* Veen, 1936 of the Lower Maastrichtian of Germany (Herrig, 1966, p. 809, pl. 19, fig. 2).

M a t e r i a l. Two intact carapaces, 37 valves, including juvenile, of well and excellently preserved from the type locality.

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